

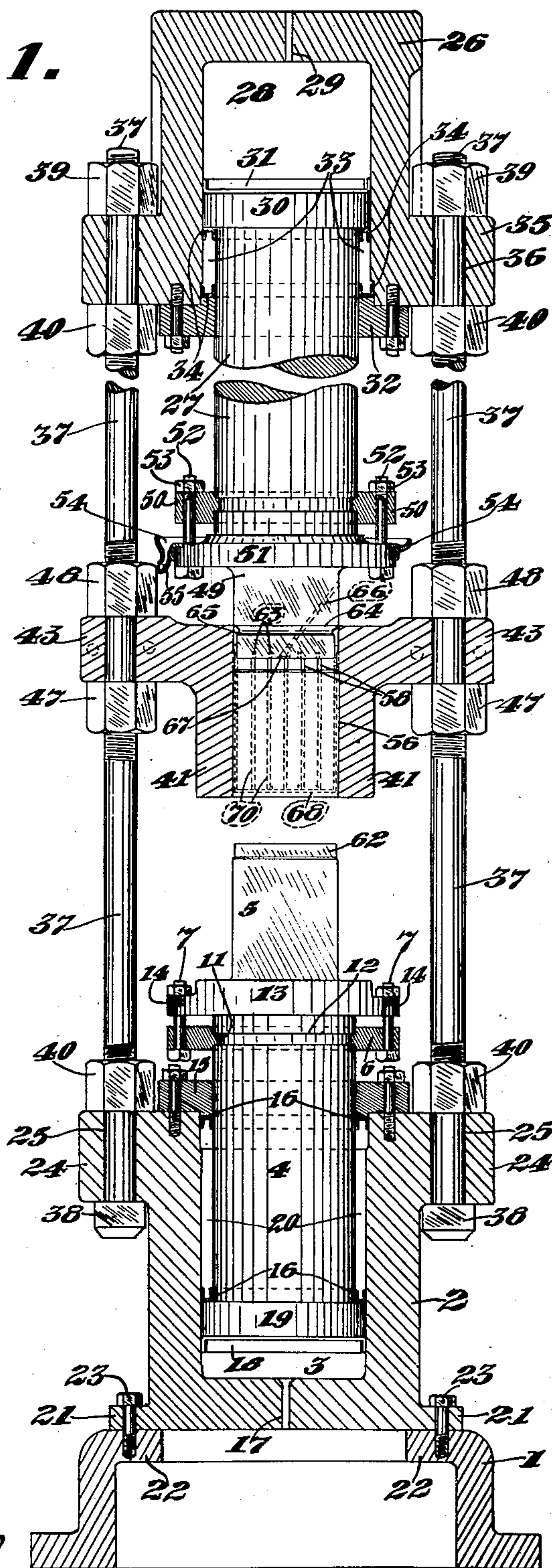
A. J. MEIER.
MACHINE FOR AND PROCESS OF FORMING LININGS FOR STORAGE BATTERY JARS.
APPLICATION FILED DEC. 24, 1908.

962,714.

Patented June 28, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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J. Waldo Christinger.

Inventor:

Albert J. Meier

By Hugh N. Wagner,
His Attorney

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3 SHEETS—SHEET 2.

Fig. 4.

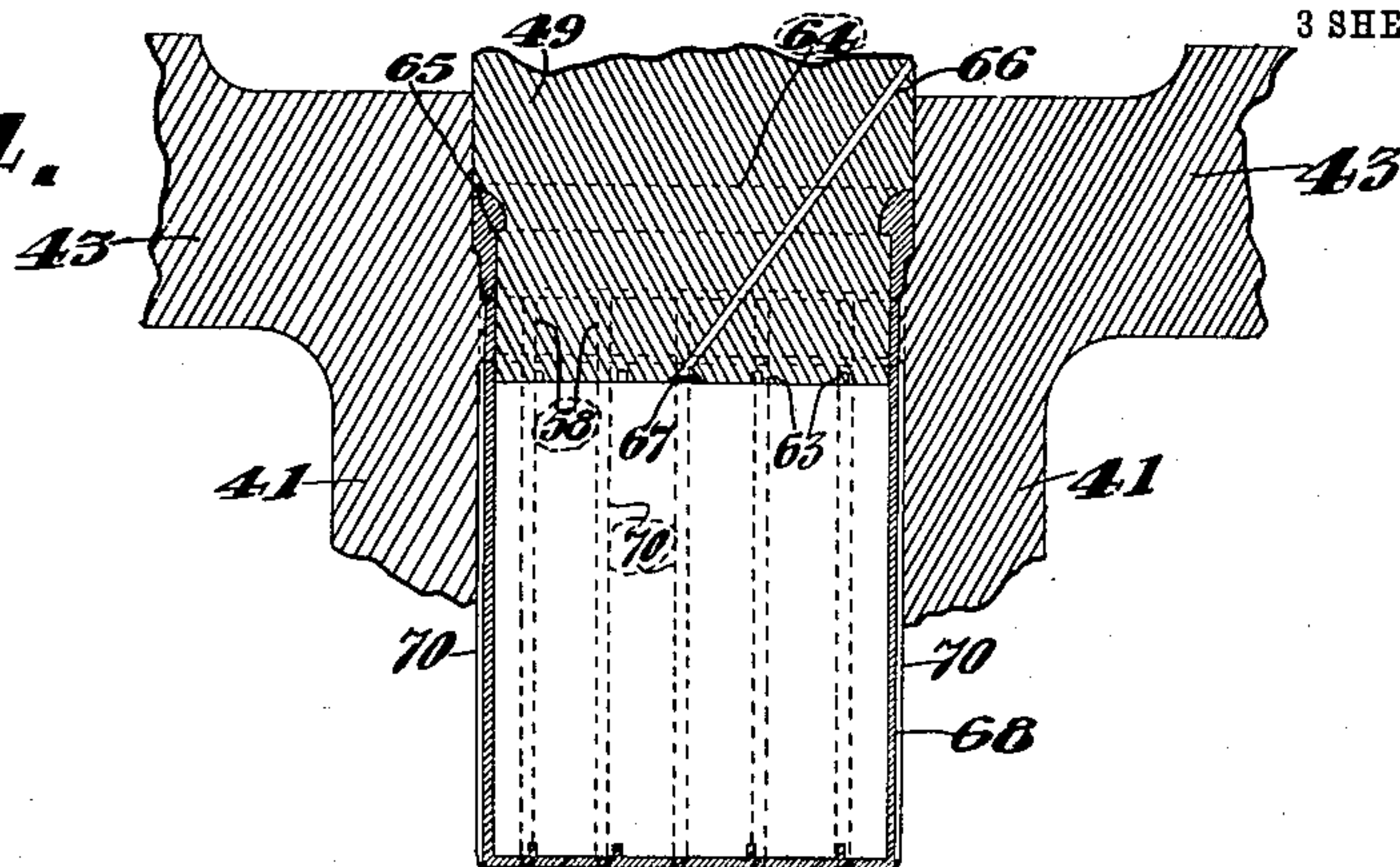


Fig. 3.

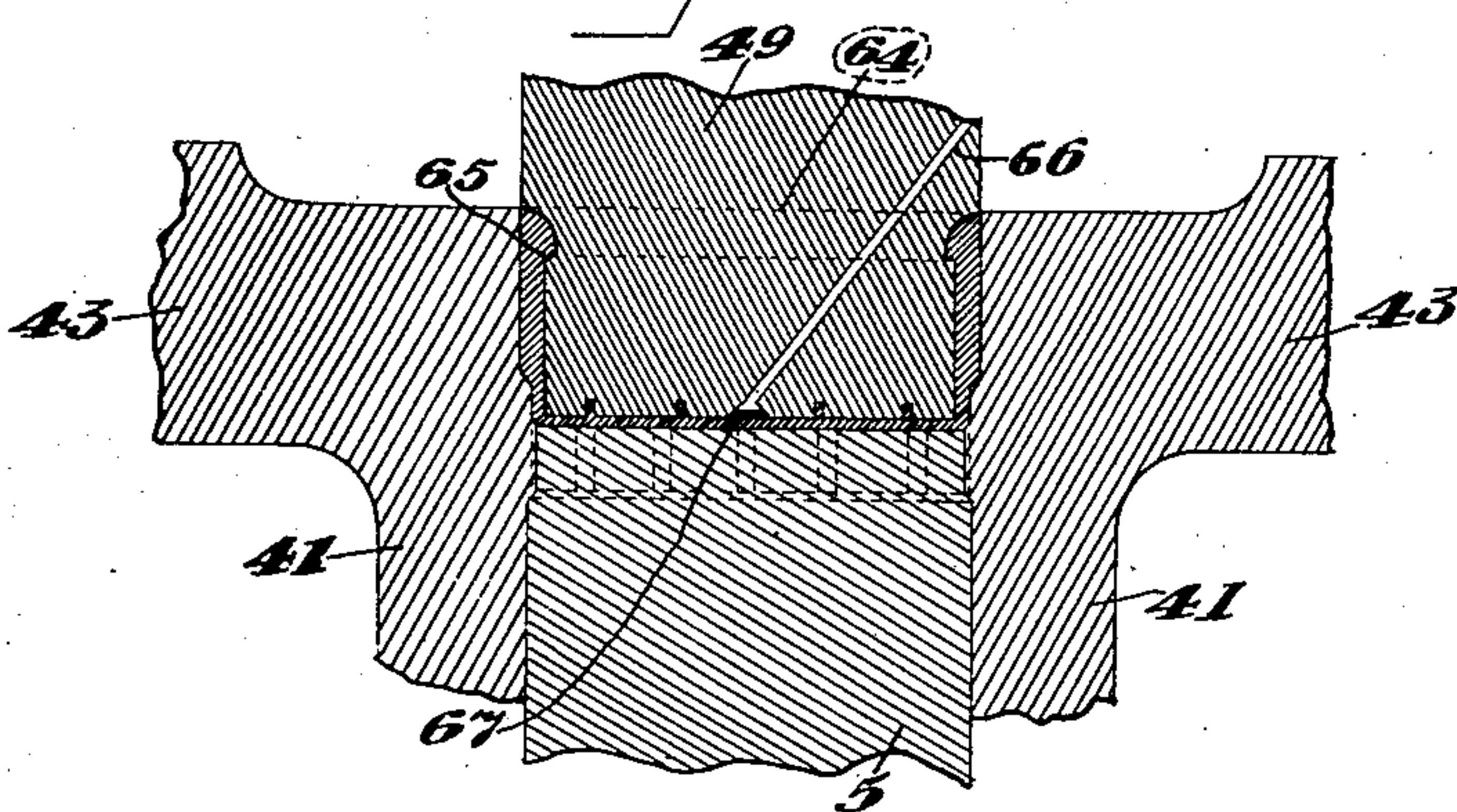
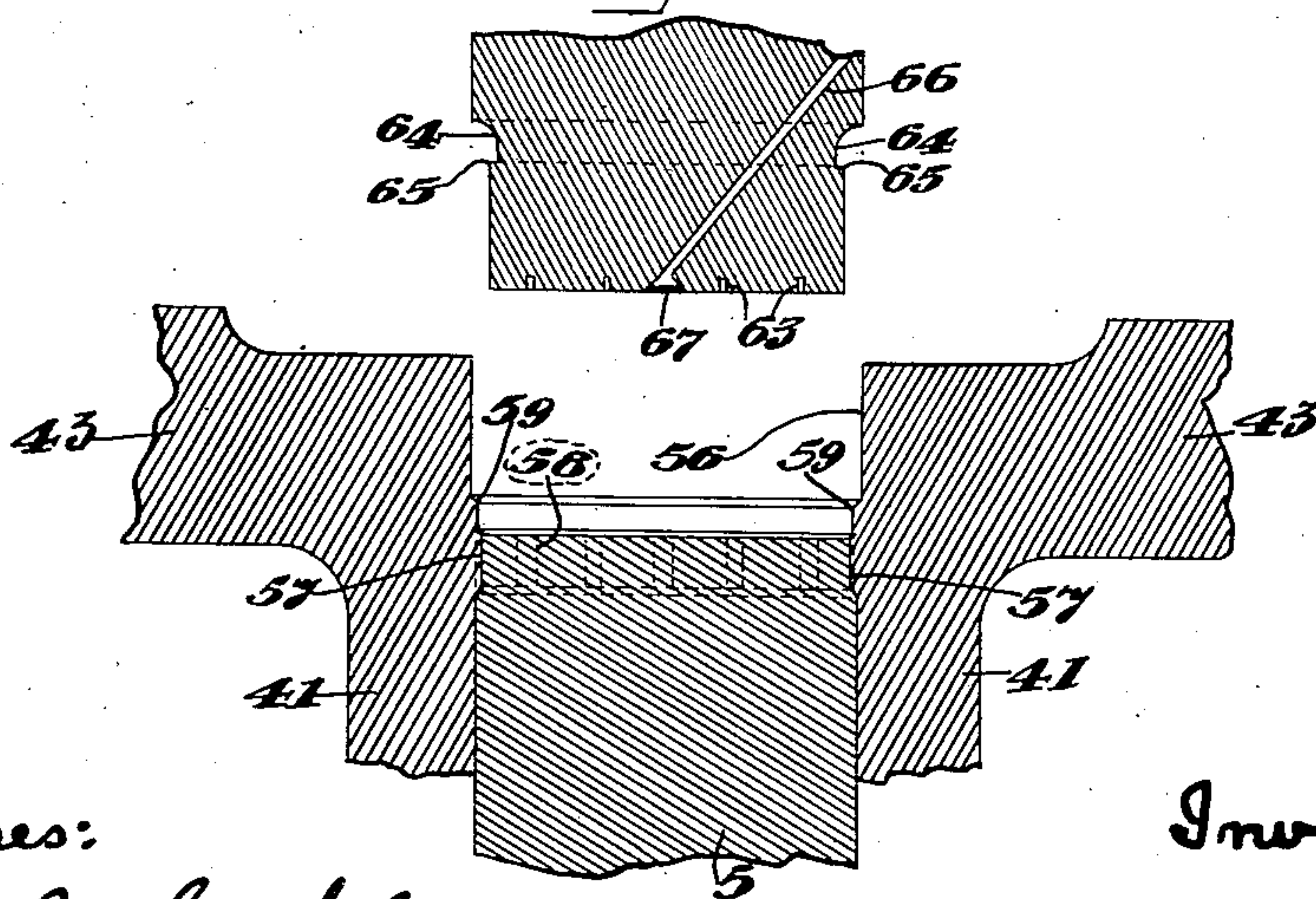


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 6.

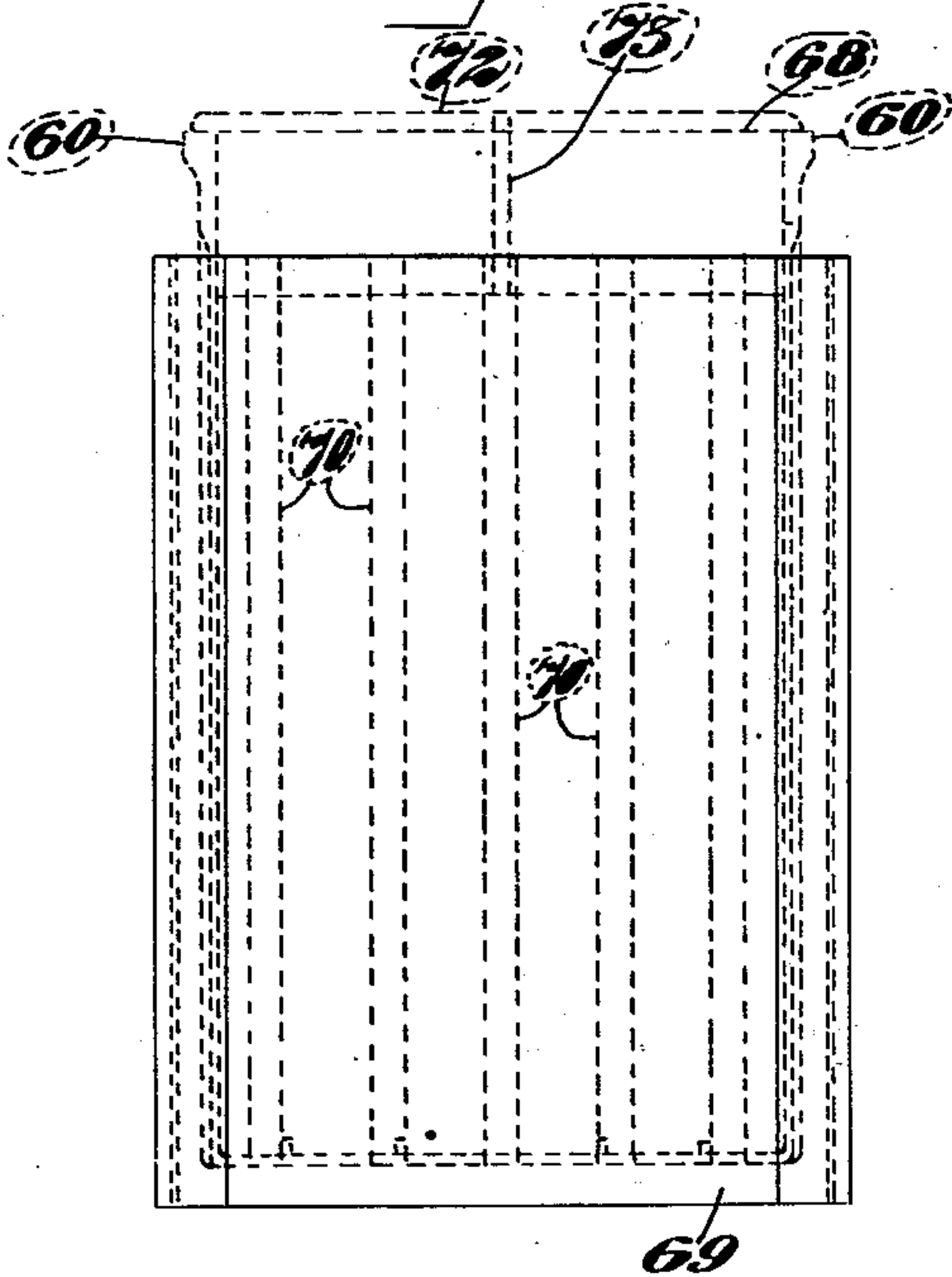


Fig. 7.

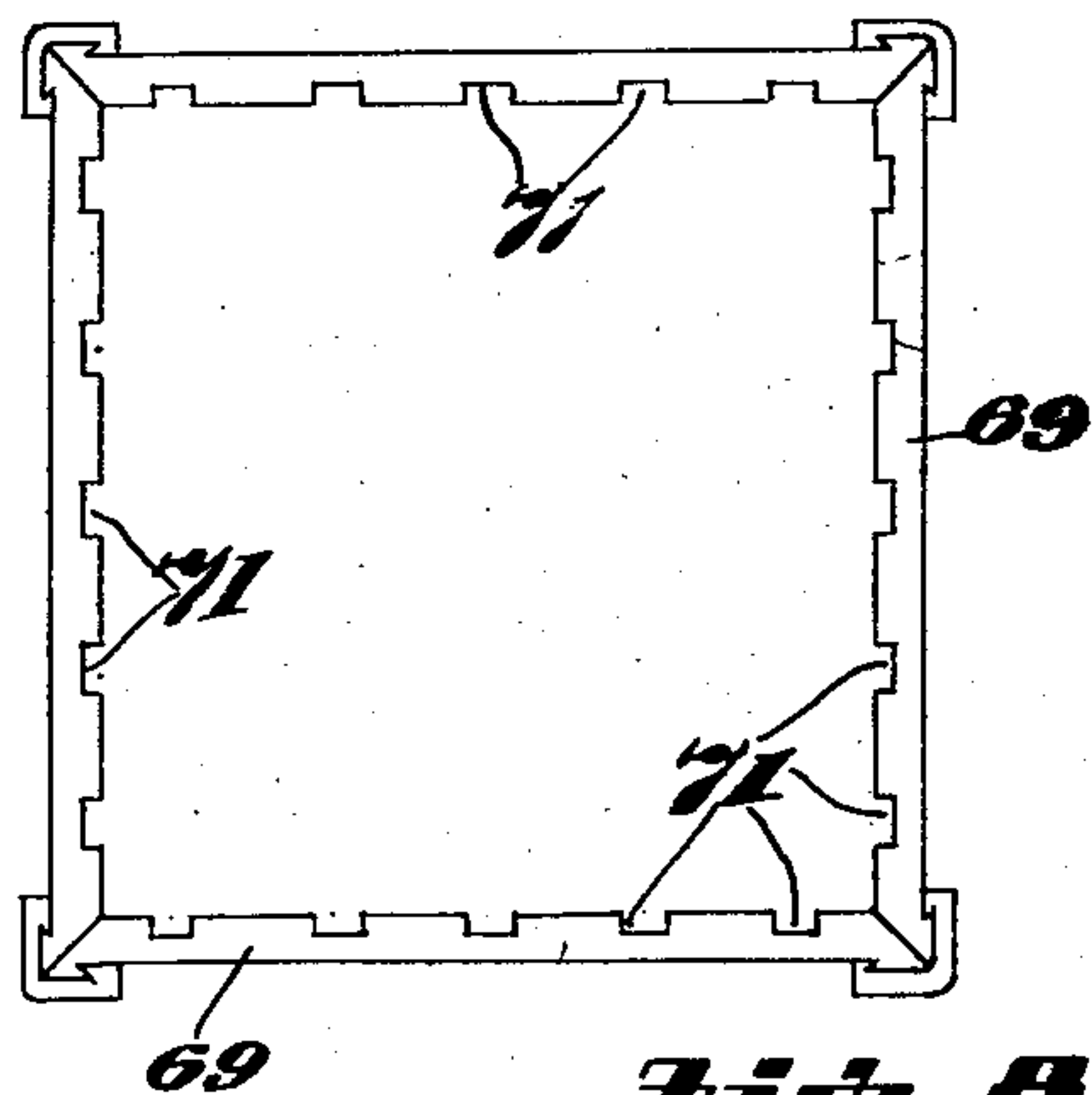


Fig. 8.

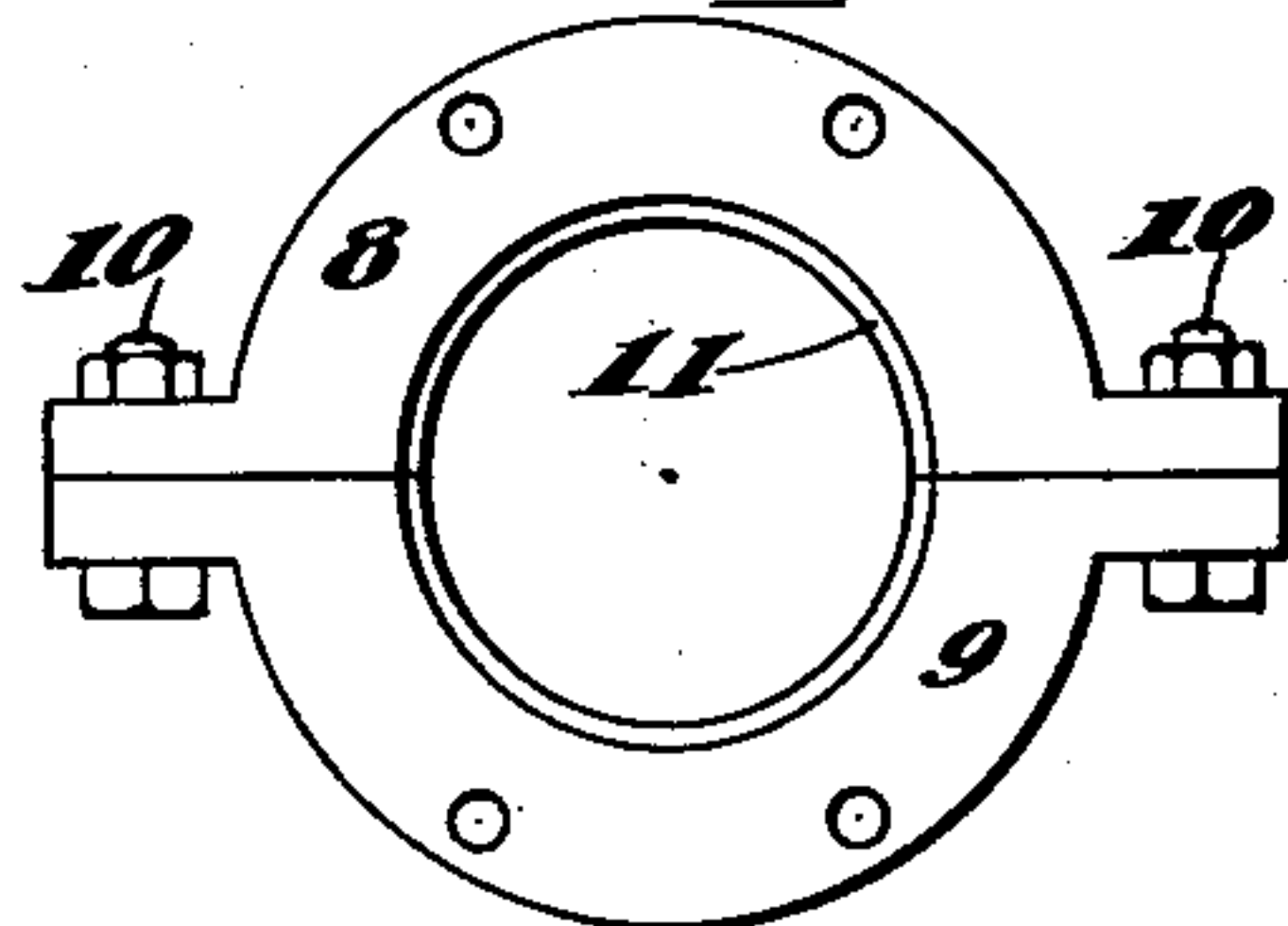
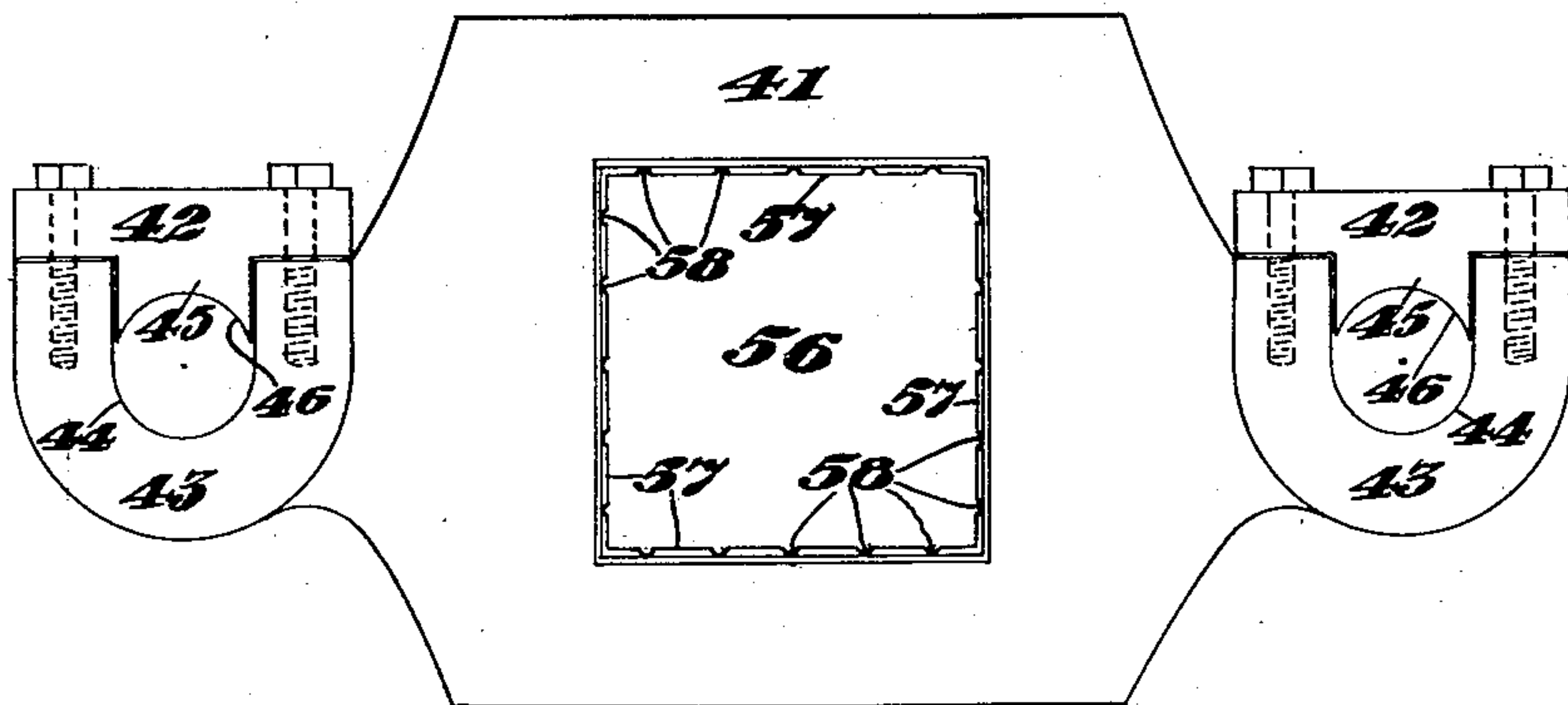


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT J. MEIER, OF GLENDALE, MISSOURI.

MACHINE FOR AND PROCESS OF FORMING LININGS FOR STORAGE-BATTERY JARS.

962,714.

Specification of Letters Patent. Patented June 28, 1910.

Application filed December 24, 1908. Serial No. 469,097.

To all whom it may concern:

Be it known that I, ALBERT J. MEIER, a citizen of the United States, residing at Glendale, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Machines for and Processes of Forming Linings for Storage-Battery Jars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention consists in a machine for making linings for storage battery jars.

In the drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a front elevation (partly in section); Figs. 2, 3, and 4 are sectional views of the molding dies, same being shown in different positions; Fig. 5 is a top plan view of the female die; Fig. 6 is an elevation of the truing device; Fig. 7 is a top plan view of same; and Fig. 8 is a top plan view of a detail.

The machine rests upon base 1, to which cylinder 2 is bolted. Piston 4 reciprocates in chamber 3 inside of cylinder 2. To one end of said piston the male die 5 is bolted by means of ring 6 and bolts 7, being thus removable therefrom. Ring 6 is composed of segments 8 and 9, fastened together by bolts 10, and is provided with a tongue 11, which fits into groove 12 formed in the periphery of piston 4. A disk 13 is integral with die 5, and flange 14 projects from said disk. Bolts 7 pass through perforations in said flange 14 and ring 6, and bind same together and die 5 to piston 4. Chamber 3 is closed by head 15, and made air-tight by gaskets 16. Piston 4 is hydraulically actuated by fluid entering chamber 3 through port 17. Ring 18 prevents the passage of said fluid beyond the enlarged head 19 of the piston 4, thus leaving air-space 20 between the head 19 and head 15. A flange 21 extends from cylinder 2 and rests upon flange 22 of base 1 and is bolted thereto by bolts 23, said flange 22 extending slightly underneath the body of cylinder 2. A flange 24, also, projects from cylinder 2, perforations 25 passing through said flange. Cylinder 26 is similar to cylinder 2, but inverted in its position and the direction of its opening. Piston 27 reciprocates in chamber 28 in cylinder 26, being hydraulically propelled by fluid entering through port 29, said piston having an enlarged head

30 similar to that on piston 4. Ring 31 in chamber 28 serves the same purpose as ring 18 in chamber 3; head 32 corresponds to head 15; and air-space 33 contains gaskets 34, which perform the same function as gaskets 16 in air-space 20. A flange 35, containing perforations 36, projects from cylinder 26. Tie-rods 37 pass through perforations 36 in flange 35 and perforations 25 in flange 24, and bind the cylinder 26 to cylinder 2, heads 38 binding against flange 24 and nuts 39 binding against flange 35. Nuts 40 suitably adjusted on said tie-rods space cylinder 26 away from cylinder 2 any necessary or desired distance. Casting 41 is adjustably supported by said tie-rods, being attached thereto by caps 42. Said casting is provided with lugs 43, each containing a recess 44 to receive one of said tie-rods. A projection 45 containing a recess 46 enables cap 42 to cooperate with recess 44 in binding casting 41 tightly upon said tie-rods, same being furthermore supported by nuts 47, upon which said lugs 43 rest and being bound thereon by nuts 48. Die 49 is attached to piston 27 by means similar to those employed in attaching die 5 to piston 4, that is to say, by means of ring 50, flange 51, bolts 52, and nuts 53. In connection with die 49, however, a drip receptacle or gutter 54 is provided, same not being necessary in connection with die 5. Said gutter 54 is borne by flange 51, and is intended to receive leakage, if any, from chamber 28, and to convey same through opening or spout 55 away from the mold in the center of casting 41. A female die is formed in the passage 56, which extends entirely through casting 41. Said female die consists of the walls of said passage 56, which may be given any desired configuration. As shown in the drawings, a flange 57, provided with indentations 58 to form corrugations on the object molded, is located within said passage and extends therearound. The shoulder 59 forms the rim 60 on the finished article. The bore of passage 56 in the portion between flange 57 and die 5 is larger than in the part opposite flange 57, and the head 62 of die 5 corresponds to the size of said passage opposite said flange 57, while the size of the remainder of said die fits that of the wider part of said passage. Thus, in operation, the main body of die 5 at the end of its forward movement abuts against flange 57, while head 62 projects

into the space bounded by said flange 57. Die 49 may be suitably configured, as, for instance, by indentations 63 in case it is desired that the object molded shall contain internal corrugations.

In order that the object when molded can be conveniently and automatically withdrawn from the female die consisting of passage 56, a groove 64 is formed in the periphery of die 49, the shoulder 65 pulling on the metal which has entered said groove and thus drawing the entire object out of passage 56. The object is then sawed or cut off die 49 on a line opposite said shoulder 65.

After die 5 has been raised into passage 56, molten metal (or other material to be molded) is poured or run into passage 56. When die 49 has entered passage 56 and molded the bottom of the article into the desired shape (which operation occurs when die 5 is in its most advanced position), die 5 is retracted, and while die 49, is continuing its forward movement to the extremity thereof, and also while it is being retracted air is admitted through passage 66, normally closed by valve 67, said valve thus preventing the exit of the metal but permitting the entrance of the air while die 49 is being retracted.

The operation of the machine is as follows: Piston 4 and die 5 are raised by hydraulic pressure applied to head 19 through port 17. Die 5, after reaching the position shown in Fig. 2, is retained there by said pressure. The required amount of molten metal is then poured into passage 56 (Fig. 2), either by hand or automatically, whereupon hydraulic pressure is applied to the head of piston 27 through port 29. Die 49 is thus forced downward to the position shown in Fig. 3, thereby forming the inner ribs on the bottom of the object to be molded. After this operation is completed, die 5 is withdrawn to its former position by releasing the pressure upon the liquid in chamber 3 and by reason of the expansion of the compressed air in air-space 20. The pressure on piston-head 30 is continued, and die 49, continuing its travel, takes the position shown in Fig. 4. The metal under pressure in passage 56 between dies 5 and 49 partly exudes into the narrow space surrounding die 49 and terminating in groove 64, beyond which said metal can not pass. The continued movement of die 49 causes the shoulder of said groove 64 opposite shoulder 65 to press the metal forward, and, as same is held in the restricted space surrounding die 49, it is thereby squeezed or forced out of said space under considerable pressure and into the elongated form of the object to be formed 68, shown in Fig. 4, the indentations 58 of the flange 57 at the same time imparting to said object 68 the external ribs 70 on the wall

thereof. As the metal expands air enters its increasing confines through the passage 66, causing the expanding body to follow the outline of the passage or die 56 and preventing its buckling or distortion. Pressure upon the liquid in chamber 28 is then relieved, and the expansion of air in air-space 33 causes die 49 to travel in the reverse direction, carrying object 68 with it. Valve 67 is opened by said movement, and the air thus admitted prevents the possible collapse of the wall of said object.

After the lining 68 has been made in the manner heretofore described, and same has been sawed on the line of shoulder 65 so as to be removed from die 49, its shape is likely to be irregular. In order to true same, a shaping chamber or finishing mold 69 is provided. The object 68 is shown in position by dotted lines in Fig. 6. Ribs 70 on said object register with grooves 71 when said object 68 is inserted into the chamber 69. Cap 72 is then fitted into the open end of object 68 and chamber 69, and closes said opening. Air pressure is then applied through opening 73 in said cap, thus finishing the object 68 by pressure against said mold 69.

Instead of utilizing the compression of air in air-space 20, hydraulic pressure may be introduced into said space through a port or ports, entering through the wall of cylinder 2 or head 15.

Having thus described my said invention, what I claim and desire to secure by Letters-Patent is:

1. In a machine of the character described, the combination of a stationary female die, an end-closing male die therefor, and a pressing die cooperating therewith, said pressing die having a main pressing surface of less cross-sectional area than said female die, a secondary pressing area co-terminus with the inside of said female die and a groove formed adjacent said secondary pressing surface.

2. In a machine of the character described, the combination of a stationary die, containing a projection and a pair of movable dies one of which is adapted to travel into contact with said projection.

3. In a machine of the character described, the combination of a casting containing a passage, the wall of said passage having a flange forming a pair of shoulders projecting thereinto, a die adapted to travel into engagement with one of said shoulders, another die adapted to force fluid material into squeezing contact with said other shoulder, and means for actuating said movable dies.

4. In a machine of the character described, the combination of a pair of cylinders, a pair of pistons adapted to reciprocate therein, each of said cylinders having

a head through which its respective piston moves, and each of said cylinders having a fluid inlet port at the opposite end thereof, there being a groove formed in each of said pistons and a tongued ring engaging each of said grooves, a die borne by each of said pistons, each die having a projection, means for binding said projection to said ring, a casting containing a cooperating female die, there being projections from said casting and from each of said cylinders and tie-rods passing through said projections on said cylinders and on said casting to bind the parts together.

5. The herein-described process of molding objects, consisting in pouring the fluid material to be molded into a suitable chamber, pressing same so as simultaneously to form part of the object and to cause the surplus material to run into a restricted passage, and, thereupon, applying further pressure to the material in said restricted passage so as, by squeezing, to project same forward, forcing in advance thereof the part already formed of the object to be molded and at the same time to form the remainder of the object.

6. The herein-described process of forming lead linings for storage battery jars, consisting in introducing molten lead into a chamber containing a movable bottom, pressing said molten lead against said bottom so as to form the bottom of the lining thereagainst, and at the same time causing the surplus metal to run into a restricted passage, removing the bottom of said chamber, and applying further pressure to the molten metal in said restricted passage so as to squeeze same out of said restricted passage, and projecting same in the form of relatively thin walls forward, carrying therewith the lining bottom previously formed.

7. The herein-described process of forming lead linings for storage battery jars,

consisting in introducing molten lead into a chamber containing a movable bottom, pressing said molten lead against said bottom so as to form the bottom of the lining thereagainst, and at the same time causing the surplus metal to run into a restricted passage, removing the bottom of said chamber, and applying further pressure to the molten metal in said restricted passage so as to squeeze same out of said restricted passage, and projecting same in the form of relatively thin walls forward, carrying therewith the lining bottom previously formed, and admitting air to prevent the collapse of said walls.

8. The herein-described process of forming lead linings for storage battery jars, consisting in introducing molten lead into a chamber containing a movable bottom, pressing said molten lead against said bottom so as to form the bottom of the lining thereagainst, and at the same time causing the surplus metal to run into a restricted passage, removing the bottom of said chamber, and applying further pressure to the molten metal in said restricted passage so as to squeeze same out of said restricted passage, and projecting same in the form of relatively thin walls forward, carrying therewith the lining bottom previously formed, and admitting air under pressure to prevent the collapse of said walls.

9. In a machine of the character described, a female die having an interiorly shouldered die passage and a pair of male dies independently movable in the die passage, one of the male dies having a shouldered pressing head for cooperation with the shoulder on the die passage.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT J. MEIER.

Witnesses:

EDNA J. GOCKEL,
GLADYS WALTON.